National Biological Information Infrastructure

STRATEGY FOR BIODIVERSITY AND ECOSYSTEMS INFORMATION FRAMEWORK DOCUMENT

The basis of all efforts to effectively conserve biodiversity and natural ecosystems while supporting economic development lies in the ability of scientists, resource managers, policy and decision makers, and the concerned public to have the widest possible access to the existing body of knowledge on biodiversity and ecosystems resources and processes. While much biodiversity and ecosystem information currently exists (from a legacy of past research and inventories), and much more is collected on a daily basis, it is still not possible for all those who could benefit from having access to this information to locate, retrieve, integrate, and apply it in any consistent fashion. In many cases, public and private funds are unknowingly spent on re-collecting information that may actually already exist in some undocumented or unavailable fashion. Much existing biodiversity and ecosystems information cannot be widely used (and may be in danger of being permanently lost) because it is not yet converted into an electronic (computerized) format. In most cases, because of different formats, conventions, or technologies, it is difficult to truly integrate information from more than one source or system.

The Biodiversity and Ecosystems Panel of the President's Committee of Advisors on Science and Technology (PCAST) in its 1998 report, *Teaming with Life: Investing in Science to Understand and Use America's Living Capital*, has recommended that, "We need to elevate the national biological information infrastructure (NBII) to a new level of capability—a "next generation"—that can make maximal use of and fully and openly share on a global basis the information generated by research on biodiversity and ecosystems."

The strategy outlined below would build on and expand recent efforts to link together the various organizations and communities that are involved in the collection and application of biodiversity and ecosystems information in a collaborative effort to create a means through which this information can be more easily accessed and shared. Development of a national biological information infrastructure, including biodiversity and ecosystems information as a major emphasis, is part of the evolving National Information Infrastructure and also a biological resource complement to the National Spatial Data Infrastructure, which focuses on expanding access to and sharing of geospatial data and information.

Because the existing (and potential) producers and users of this broad array of information come from local, state, and federal government; from non-government organizations; from academia; and from the public; planning and development of a distributed information network must be a collaborative effort. The strategy identifies major goals and objectives that all of the interested participants can agree to and identify with, while allowing freedom for these various communities to contribute toward achieving this vision in ways that are most suited to their respective missions and responsibilities.

GOAL 1: **OBTAIN THE BROADEST POSSIBLE PARTICIPATION OF BOTH PUBLIC AND PRIVATE SECTORS.**

Working together, all interested participants develop the national biological information infrastructure through which biodiversity and ecosystems data and information provided by many distributed sources can be readily accessed and shared.

Objectives:

1. Through outreach and education, enhance understanding by all existing and potential participants of the common vision and mutual benefits of a national biological information infrastructure.

2. Define the fundamental data and information components of a fully functional national biological information infrastructure, and formulate a long-term plan to ensure that these biodiversity and ecosystems data and information components are developed and maintained as an essential part thereof.

3. Encourage biodiversity and ecosystems data and information providers to incorporate their data and information into a national biological information infrastructure.

4. Coordinate development of a national biological information infrastructure with other related national and international data and information access and sharing networks, such as the National Spatial Data Infrastructure, the Global Change Data and Information System, and the Convention on Biological Diversity Clearinghouse Mechanism. Identify areas of mutual interest and opportunities for resource sharing and leveraging among these different initiatives.

5. Identify and promote policies and programs that will stimulate governmental and non-governmental entities to participate fully in the planning, development, and operation of a national biological information infrastructure.

GOAL 2: **ENCOURAGING GREATER COORDINATION OF AND SUPPORT FOR R&D ON ADVANCED SYSTEMS AND TECHNOLOGIES**

Encourage greater coordination of and support for research and development in order to provide more advanced, efficient systems and technologies for collection, access, sharing and exchange, and application of biodiversity and ecosystems data and information.

Objectives:

1. Identify and promote research, development, and implementation of tools, technologies, and architectures that are needed to enable greater sharing and exchange of biodiversity and ecosystems data and information for a broad range of applications.

2. Provide a mechanism through which participants can define their respective interests and complementary roles in supporting research, development and implementation of new tools,

technologies, and architectures for the biodiversity and ecosystems component of a national biological information infrastructure.

3. Promote specific activities that allow participants to work innovatively and cooperatively on tool and technology development by linking related and complementary development efforts, sharing resources, and leveraging existing investments.

4. Identify and work to remove any significant barriers (policy, regulatory, institutional) to pursuit of these innovative, cooperative opportunities.

GOAL 3: PROMOTING THE USE OF COLLABORATIVELY DEVELOPED STANDARDS

Promote collaborative development and implementation of data standards for collection, access, sharing and exchange, and application of biodiversity and ecosystems data.

Objectives:

1. Work in public-private partnerships to identify and prioritize data standards that will enable greater data access, sharing, and application of biodiversity and ecosystems data and information.

2. Promote development, adoption, and implementation of biodiversity and ecosystems data standards.

3. Encourage linkages among development and implementation of biodiversity and ecosystems data standards and comparable standards development activities in the Federal Geographic Data Committee, as well as with national (ANSI) and international (ISO) standards programs.

GOAL 4: INCREASING FEDERAL R&D TO SUPPORT BIODIVERSITY AND ECOSYSTEMS INFORMATICS

Promote greater use of existing federal research and development programs (including federal grants programs) to support advancements in the area of biodiversity and ecosystems informatics, as part of the development of an overall national biological information infrastructure.

Objectives:

1. Identify existing federal R&D programs that have the greatest potential to help support technology and infrastructure development for biodiversity and ecosystems data (e.g., Digital Libraries Initiative; NSF's Knowledge and Distributed Intelligence Initiative and Life in Earth's Environment Initiative; and R&D programs under auspices of NSTC's Committee on Computing, Information, and Communications).

2. Promote measures through which the offices/agencies responsible for each of these existing programs can increase the portion of funding resources directed toward biodiversity and ecosystems informatics.

GOAL 5: COOPERATIVELY DEVELOP THE LONG-RANGE IMPLEMENTATION PLAN FOR THE NEXT GENERATION NBII

Develop a long-range plan for design and implementation of the "next generation" national biological information infrastructure. This system should include several specialized regional nodes that would support information sciences research and development involving biodiversity and ecosystems data, as well as the automatic discovery, indexing, retrieval, integration, and archiving of biodiversity and ecosystems data and information.

Objectives:

1. Establish a national-level interagency and public-private task force to plan the development of the "next generation" biological information infrastructure. This task force would build on the recommendations for the National Biological Information Infrastructure (NBII) provided in the PCAST *Teaming with Life* report.

2. Identify the funding and coordination mechanisms for the information science research needed to fully realize the biodiversity and ecosystems components of the "next generation" biological information infrastructure.

3. Develop an out-year (FY 2001) cross-agency budget initiative to provide initial federal funding support for development of the biodiversity and ecosystems components of the "next generation" national biological information infrastructure. This cross-agency initiative would include a competition for funding to establish the initial set of regional research nodes, and would require development of a Request for Proposals, as well as planning for the funding mechanism.

Comments ~ We are soliciting input from all stakeholders; please send any comments or interest in getting involved in NBII development to:

Biodiversity and Ecosystems Informatics Work Group
c/o Bonnie C. Carroll
Information International Associates, Inc. (IIa)
P.O. Box 4219
Oak Ridge, TN 37831
E-mail: **bcarroll@infointl.com**
Tele: 423/481-0388
Fax. 423/481-0390

NBII Program Manager
c/o Anne Frondorf
USGS/Biological Resources Division
12201 Sunrise Valley Drive
Reston, VA 20192
E-mail: **anne_frondorf@usgs.gov**
Tele: 703/648-4205
Fax: 703/648-4224